Amendments to the Claims

The following listing of the claims shows all amendments made to the claims of the international application.

1. (*Original*) A method of producing spatially localized injury to vasculature in a live animal, the method comprising:

targeting vasculature in three dimensions for photodisruption; and

focusing ultrashort laser pulses on the targeted vasculature to produce localized photodisruption.

2. (*Original*) The method of claim 1, further comprising observing physiological parameters in the animal.

3. (*Currently amended*) The method of ~~either~~ claim 1 ~~or claim 2~~, wherein the step of targeting comprises using a microscope objective.

4. (*Original*) The method of claim 3, wherein the microscope objective has a numerical aperture within a range of 0. 1 to 1.3.

5. (*Original*) The method of claim 3, wherein the microscope objective is a component of a two-photon laser scanning microscope.

6. (*Currently amended*) The method of claim 5, further comprising observing the target vasculature using the microscope simultaneously with the photodisruption.

7. (*Currently amended*) The method of claim 1, further comprising observing the target vasculature using optical coherence tomography simultaneously with the photodisruption.

8. (*Canceled*)

9. (*Original*) The method of claim 1, wherein the step of targeting comprises using optical coherence tomography.

10. (*Currently amended*) The method of ~~any one of claims 1 through 9~~ claim 1, wherein the laser pulses have an energy adapted to drive a nonlinear interaction within the target vasculature.

11. (*Currently amended*) The method of ~~any one of claims 1 through 10~~ claim 1, wherein the laser pulses have pulsewidths in a range from 10 femtoseconds to 100 picoseconds.

12. (*Currently amended*) The method of ~~any one of claims 1 through 11~~ claim 1, further comprising preparing the animal to provide optical access to the vasculature via a transparent window formed in the animal.

13. (*Original*) The method of claim 12, wherein the window is adapted to provide access for insertion of electrical probes.

14. (*Currently amended*) The method of ~~any one of claims 1 through 13~~ claim 1, further comprising injecting the animal with a substance for labeling the blood stream.

15. (*Original*) The method of claim 14, wherein the substance is a water-soluble fluorescent tracer or fluorescently-labeled erythrocytes.

16. (*Currently amended*) The method of ~~any one of claims 1 through 15~~ claim 1, further comprising measuring blood flow in the targeted vasculature.

17. (*Currently amended*) The method of ~~any one of claims 1 through 16~~ claim 1, wherein the localized injury comprises vascular damage of a type selected from among thrombosis, hemorrhage and breach of the blood-brain barrier.

18. (*Original*) A method for in vivo modeling of vascular disorder, comprising:

preparing an animal for optical access to vasculature; and

targeting vasculature in three dimensions for photodisruption ; and focusing ultrashort laser pulses on the target vasculature to produce localized photodisruption, wherein the laser pulses have an energy adapted to drive a nonlinear interaction within the target vasculature.

19. (*Original*) The method of claim 18, wherein the step of targeting comprises using a microscope objective.

20. (*Original*) The method of claim 19, wherein the microscope objective has a numerical aperture within a range of 0.1 to 1.3.

21. (*Currently amended*) The method of ~~either~~ claim 19 ~~or claim 20~~, wherein the microscope objective is a component of a two-photon laser scanning microscope.

22. (*Currently amended*) The method of claim 21, further comprising observing the target vasculature using the microscope simultaneously with the photodisruption.

23. (*Currently amended*) The method of ~~any one of claims 18 through 21~~ claim 18, further comprising observing the target vasculature using optical coherence tomography simultaneously with the photodisruption.

24. (*Canceled*)

25. (*Currently amended*) The method of ~~any one of claims 18 through 24~~ claim 18 ,wherein the step of targeting comprises using optical coherence tomography.

26. (*Currently amended*) The method ~~any one of claims 18 through 25~~ of claim 18, further comprising observing physiological parameters within the animal using one or a combination of two-photon laser scanning microscopy, magnetic resonance imaging, functional magnetic resonance imaging, multi-spectral intrinsic imaging, positron emission tomography, time resolved light scattering, Doppler flowmetry, and optical coherence tomography.

27. (*Currently amended*) The method of ~~any one of claims 18 through 26~~ claim 18, further comprising observing physiological parameters within the animal using post-mortem histology.

28. (*Currently amended*) The method of ~~any one of claims 18 through 27~~ claim 18, wherein the laser pulses have pulsewidths in a range from 10 femtoseconds to 100 picoseconds.

29. (*Currently amended*) The method of ~~any one of claims 18 through 28~~ claim 18, wherein preparing the animal comprises forming a window for optical access to the target vasculature.

30. (*Currently amended*) The method of ~~any one of claims 18 through 29~~ claim 18, wherein preparing the animal comprises injecting the animal with a substance for labeling the blood stream.

31. (*Original*) The method of claim 30, wherein the substance is a water-soluble fluorescent tracer or fluorescently-labeled erythrocytes.

32. (*Currently amended*) The method of ~~any one of claims 18 through 24~~ claim 18, further comprising measuring blood flow in the targeted vasculature.

33. (*Currently amended*) The method of ~~any one of claims 18 through 24~~ claim 18, wherein the localized photodisruption comprises vascular damage of a type selected from among thrombosis, hemorrhage, and breach of the blood-brain barrier.

34. (*Original*) A method for observing vascular disease or injury in real time, comprising:

preparing an animal for optical access to vasculature; and

targeting vasculature in three dimensions for photodisruption ;

focusing ultrashort laser pulses on the target vasculature to produce localized photodisruption, wherein the laser pulses have an energy adapted to drive a nonlinear interaction within the target vasculature; and observing physiological parameters of the animal before, during and after photodisruption.

35. (*Original*) The method of claim 34, wherein the step of targeting comprises using a microscope objective.

36. (*Original*) The method of claim 35, wherein the microscope objective has a numerical aperture within a range of 0.1 to 1.3.

37. (*Currently amended*) The method of ~~either~~ claim 35 ~~or claim 36~~, wherein the microscope objective is a component of a two-photon laser scanning microscope.

38. (*Original*) The method of claim 37, further comprising observing the target vasculature using the microscope.

39. (*Currently amended*) The method of ~~any one of claims 35 through 38~~ claim 35, further comprising observing the target vasculature using optical coherence tomography.

40. (*Original*) The method of either claim 38 or claim 39, wherein the step of observing is performed simultaneously with photodisruption.

41. (*Original*) The method of claim 35, wherein the step of targeting comprises using optical coherence tomography.

42. (*Currently amended*) The method of ~~any one of claims 35 through 41~~ claim 35, wherein observing comprises using one or a combination of two-photon laser scanning microscopy, magnetic resonance imaging, functional magnetic resonance imaging, multi-spectral intrinsic imaging, positron emission tomography, time resolved light scattering, Doppler flowmetry, and optical coherence tomography.

43. (*Currently amended*) The method of ~~any one of claims 35 through 42~~ claim 35, wherein observing after photodisruption comprises using post-mortem histology.

44. (*Currently amended*) The method of ~~any one of claims 35 through 43~~ claim 35, wherein the laser pulses have pulsewidths in a range from 10 femtoseconds to 100 picoseconds.

45. (*Currently amended*) The method of ~~any one of claims 35 through 44~~ claim 35, wherein preparing the animal comprises injecting the animal with a substance for labeling the blood stream.

46. (*Original*) The method of claim 45, wherein the substance is a water-soluble fluorescent tracer or fluorescently-labeled erythrocytes.

47. (*Currently amended*) The method of ~~any one of claims 35 through 46~~ claim 35, further comprising measuring blood flow in the targeted vasculature.

48. (*Currently amended*) The method of ~~any one of claims 35 through 47~~ claim 35, wherein the localized photodisruption comprises vascular damage of a type selected from among thrombosis, hemorrhage, and breach of the blood-brain barrier.

49. (*Original*) A device for producing spatially-localized injury to vasculature in an animal, comprising:

an animal mount for holding the animal in a fixed position;

an optical source for producing a photodisruption beam, wherein the photodisruption beam comprises a plurality of ultrashort pulses adapted for driving a nonlinear interaction within the target vasculature; and

a microscope objective for focusing the photodisruption beam onto target vasculature in the animal; wherein the animal has a window formed therein for providing optical access to the target vasculature.

50. (*Original*) The device of claim 49, wherein the optical source comprises an optical oscillator and an optical pump.

51. (*Currently amended*) The device of ~~either~~ claim 49 ~~or 50~~, wherein the optical source further comprises an optical amplifier.

52. (*Currently amended*) The device of ~~any one of claims 49 through 51~~ claim 49, further comprising detectors for detecting light produced in the animal by the ultrashort pulses.

53. (*Currently amended*) The device of ~~any one of claims 49 through 52~~ claim 49, wherein an imaging beam is directed through the microscope objective for imaging the animal.

54. (*Currently amended*) The device of ~~any one of claims 49 through 53~~ claim 49, wherein the microscope objective is part of a two photon laser scanning microscope.

55. (*Currently amended*) The device of ~~any one of claims 49 through 53~~ claim 49, wherein the microscope objective is part of an optical coherence tomography microscope.

56. (*Currently amended*) The device of ~~any one of claims 49 through 55~~ claim 49, wherein the animal mount comprises a kinematic mount for the removal and repositioning of the animal.

57. (*Currently amended*) The device of ~~any one of claims 49 through 56~~ claim 49, further comprising a measurement device for observing blood flow in the animal.

58. (*Currently amended*) The device of ~~any one of claims 49 through 57~~ claim 49, wherein the ultrashort pulses have pulsewidths in a range from 10 femtoseconds to 100 picoseconds.